

WHAT IS CLAIMED IS:

1. An ink jet recording apparatus comprising:  
a recording head for discharging ink from a  
plurality of discharge ports and recording onto a  
5 recording medium;

a carriage on which said recording head is  
mounted and which reciprocatively scans on said  
recording medium;

recording medium conveying means for conveying  
10 said recording medium in the direction perpendicular  
to a scanning direction of said carriage by a  
predetermined distance each time said carriage  
reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does  
15 not exercise an influence on the reciprocative scan  
of said carriage and the conveyance of said recording  
medium by said recording medium conveying means;

an ink supply tube for supplying the ink from  
said ink tank to said recording head; and

20 control means for controlling an ink discharge  
state of said recording head on the basis of an image  
signal which is inputted from an upper apparatus,

wherein said control means adjusts a scanning  
speed of said carriage so as to suppress an increase  
25 in negative pressure in said supply tube.

2. An ink jet recording apparatus comprising:

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a recording head for discharging ink from a plurality of discharge ports and recording onto a recording medium;

a carriage on which said recording head is  
5 mounted and which reciprocatively scans on said recording medium;

recording medium conveying means for conveying said recording medium in the direction perpendicular to a scanning direction of said carriage by a  
10 predetermined distance each time said carriage reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does not exercise an influence on the reciprocative scan of said carriage and the conveyance of said recording  
15 medium by said recording medium conveying means;

an ink supply tube for supplying the ink from said ink tank to said recording head; and

control means for controlling an ink discharge state of said recording head on the basis of an image  
20 signal which is inputted from an upper apparatus,

wherein said control means adjusts a non-recording time as a time during which no ink is discharged from said recording head so as to recover a pressure in said supply tube.

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3. An ink jet recording apparatus comprising:  
a recording head for discharging ink from a

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plurality of discharge ports and recording onto a recording medium;

a carriage on which said recording head is mounted and which reciprocatively scans on said  
5 recording medium;

recording medium conveying means for conveying said recording medium in the direction perpendicular to a scanning direction of said carriage by a predetermined distance each time said carriage  
10 reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does not exercise an influence on the reciprocative scan of said carriage and the conveyance of said recording medium by said recording medium conveying means;

15 an ink supply tube for supplying the ink from said ink tank to said recording head; and

control means for controlling an ink discharge state of said recording head on the basis of an image signal which is inputted from an upper apparatus,

20 wherein said control means adjusts the number of overlap recording scanning times of said carriage so as to recover a pressure in said supply tube.

4. An apparatus according to claim 1, wherein a  
25 pressure smoothing tank which can store the ink of a predetermined capacity is arranged between said supply tube and said recording head in order to

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suppress the increase in negative pressure in said supply tube.

5. An apparatus according to claim 4, wherein  
5 the capacity of said pressure smoothing tank is equal to or larger than 1 cc.

6. An apparatus according to claim 1, wherein  
when the number of dots to be discharged of the ink  
10 which is discharged from said recording head per unit time, in which said number has been calculated from said image signal, is equal to or larger than a reference discharge number, said control means determines that the negative pressure in said supply  
15 tube has increased.

7. An apparatus according to claim 6, wherein  
when a print duty is equal to a predetermined value, said reference discharge number is equal to a  
20 discharge number in which it has previously been confirmed that no recording variation occurs.

8. An apparatus according to claim 6, wherein  
said reference discharge number is equal to a  
25 reference discharge number calculated on the basis of an ink flow rate and a presumed negative pressure calculated by a predetermined pressure calculating

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equation.

9. An apparatus according to claim 4, wherein  
the increase in negative pressure in said tube is  
5 detected by a pressure sensor provided in said  
pressure smoothing tank.

10. An apparatus according to claim 1, further  
comprising recovery means for recovering a discharge  
10 state of the ink of said recording head to a good  
state by forcibly discharging the ink from each  
discharge port of said recording head.

11. An apparatus according to claim 1, wherein  
15 said recording head has an electrothermal converting  
element for converting an electric energy into a  
thermal energy and discharges the ink by using a film  
boiling that is caused in the ink by the thermal  
energy which is applied by said electrothermal  
20 converting element.

12. An ink jet recording method in a recording  
control method for an ink jet recording apparatus  
comprising:  
25 a recording head for discharging ink from a  
plurality of discharge ports and recording onto a  
recording medium;

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a carriage on which said recording head is mounted and which reciprocatively scans on said recording medium;

recording medium conveying means for conveying  
5 said recording medium in the direction perpendicular to a scanning direction of said carriage by a predetermined distance each time said carriage reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does  
10 not exercise an influence on the reciprocative scan of said carriage and the conveyance of said recording medium by said recording medium conveying means;

an ink supply tube for supplying the ink from said ink tank to said recording head; and

15 control means for controlling an ink discharge state of said recording head on the basis of an image signal which is inputted from an upper apparatus,

wherein said method has a step of reducing a scanning speed of said carriage when the number of  
20 dots (to be discharged) of the ink which is discharged from said recording head per unit time, in which said number has been calculated from said image signal, is equal to or larger than a reference discharge number.

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13. An ink jet recording method in a recording control method for an ink jet recording apparatus

comprising:

a recording head for discharging ink from a plurality of discharge ports and recording onto a recording medium;

5 a carriage on which said recording head is mounted and which reciprocatively scans on said recording medium;

recording medium conveying means for conveying said recording medium in the direction perpendicular  
10 to a scanning direction of said carriage by a predetermined distance each time said carriage reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does not exercise an influence on the reciprocative scan  
15 of said carriage and the conveyance of said recording medium by said recording medium conveying means;

an ink supply tube for supplying the ink from said ink tank to said recording head; and

control means for controlling an ink discharge  
20 state of said recording head on the basis of an image signal which is inputted from an upper apparatus,

wherein said method has a step of extending a non-recording time as a time during which no ink is discharged from said recording head when the number  
25 of dots (to be discharged) of the ink which is discharged from said recording head per unit time, in which said number has been calculated from said image

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signal, is equal to or larger than a reference discharge number.

14. An ink jet recording method in a recording  
5 control method for an ink jet recording apparatus  
comprising:

a recording head for discharging ink from a plurality of discharge ports and recording onto a recording medium;

10 a carriage on which said recording head is mounted and which reciprocatively scans on said recording medium;

recording medium conveying means for conveying said recording medium in the direction perpendicular  
15 to a scanning direction of said carriage by a predetermined distance each time said carriage reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does not exercise an influence on the reciprocative scan  
20 of said carriage and the conveyance of said recording medium by said recording medium conveying means;

an ink supply tube for supplying the ink from said ink tank to said recording head; and

control means for controlling an ink discharge  
25 state of said recording head on the basis of an image signal which is inputted from an upper apparatus,

wherein said method has a step of increasing

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the number of overlap recording scanning times of  
said carriage when the number of dots (to be  
discharged) of the ink which is discharged from said  
recording head per unit time, in which said number  
5 has been calculated from said image signal, is equal  
to or larger than a reference discharge number.

15. A method according to claim 12, wherein  
said reference discharge number is equal to a  
10 reference discharge number calculated on the basis of  
an ink flow rate and a presumed negative pressure  
calculated by a predetermined pressure calculating  
equation.

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